CONSUMER RESPONSE TO STREET CHARACTERISTICS

Alberta
MUNICIPAL AFFAIRS
Innovative Housing Grants Program

CONSUMER RESPONSE TO STREET CHARACTERISTICS

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Prepared by:

City of Calgary Transportation Department

The views and conclusions expressed and the recommendations made in this report are entirely those of the authors and should not be construed as expressing the opinions of the Alberta Department of Housing.

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FOREWORD

The project documented in this report received funding under the Innovative Housing Grants Program of the Alberta Department of Housing. The Innovative Housing Grants Program is intended to encourage and assist housing research and development which will reduce housing costs, improve the quality and performance of dwelling units and subdivisions, or increase the long term viability and competitiveness of Alberta's housing industry.

The Program offers assistance to builders, developers, consulting firms, professionals, industry groups, building products manufacturers, municipal governments, educational institutions, non-profit groups and individuals. At this time, priority areas for investigation include building design, construction technology, energy conservation, site and subdivision design, site servicing technology, residential building product development or improvement and information technology.

As the type of project and level of resources vary from applicant to applicant, the resulting documents are also varied. Comments and suggestions on this report are welcome. Please send comments or requests for further information to:

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EXECUTIVE SUMMARY

The main goal of the work discussed in this report was to determine the attitudes of residential dwellers to various street characteristics in their neighbourhoods in order to assess whether the City of Calgary's existing street standards are still acceptable and affordable. The work conducted included the soliciting of opinions from the public on both engineering related standards (pavement width, right-of-way etc.) and environmental guidelines (building setbacks, traffic volume limits, etc.).

The project was initiated in response to requests from the development industry to reduce current street standards to promote the provision of more affordable housing. In addition, increasing public consciousness of various environmental issues relating to subdivision design has resulted in a need to examine such factors as traffic volume, speed and safety.

The methodology employed was to initially hold "focus group" discussion sessions with a number of residents to determine issues to be included in a telephone questionnaire. The telephone questionnaire was then used to investigate the respondents' satisfaction with their community environment.

From the results of the survey a number of conclusions were drawn. The survey showed that factors related to traffic such as safety of children, quietness and traffic volumes are important characteristics of a neighbourhood - all of above average importance. It was also very apparent from the survey results that the more traffic the respondents perceived on their street, the more likely they were to be annoyed by it. For collector streets with the traffic volumes over 2,000 vehicles per day there was a correlation between actual and perceived volumes of traffic and annoyance occurred above the existing 5,000 vehicles per day guideline. On residential streets there appeared to be no correlation between actual and perceived volumes.

With respect to street engineering standards, respondents expressed general satisfaction with the status quo. It has been concluded that there should be no change to the current standards for items such as street pavement, however, some items such as lane paving could be options which can be added later at the home owner's expense.

STREET CHARACTERISTICS

1.0 Introduction

This paper documents the results of a study done to determine the response of residential dwellers to street characteristics in their neighbourhoods.

Street standards have evolved in Calgary over time, and define such measurable criteria as pavement width, right-of-way, sidewalks, building setback, traffic volume limits, and gradients. A hierarchy of local streets, collector and major arterials is used and is typical of that employed in many other cities.

In recent years, an increasing public consciousness of environmental conditions has resulted in a need to critically examine such factors as traffic volume, speed, and safety conditions on neighbourhood streets. Vocal and emotional citizens demanding protection from perceived deteriorating environmental conditions on their streets are becoming more commonplace. On the other hand, cost-awareness in providing marketable new neighbourhood subdivisions or protecting the ambience of older residential areas has produced pressure to reduce standards and roadway costs.

The purpose of the work reported on here was to elicit opinions from the public at large with regard to general street characteristics and to determine if, besides the people who complain, there is any consensus with regard to acceptable and affordable street standards.

The methodology used was to hold separate 'focus group' discussions with residents living along streets from which complaints had been received and with residents from streets which appear to have similar measurable characteristics but from which complaints were not being registered. The focus groups were divided between people who said they had a problem with their street and those who did not. The issues brought out at the focus group discussions were used to design a telephone questionnaire.

The telephone questionnaire was used to investigate the respondents' satisfaction with their community environment concentrating on street issues such as travel lanes, traffic volume and speed, parking, transit buses, realty values, etc. Also solicited was information on what street related items the respondent would be willing to do without or reduce to make streets more affordable.

Following the telephone questionnaire, the qualitative assessment by selected respondents of the traffic volume on their street was compared to actual vehicle counts. The selection procedure for this comparison ensured a cross section of respondents who had various perceptions of traffic volumes on collector and residential streets.

The results of this survey will be of interest to transportation engineers and planners who are involved in the development of residential neighbourhoods or who deal with traffic related environmental issues.

2.0 Calgary Characteristics

Calgary is a young city, founded a little over one hundred years ago (1875) as a fort for the North West Mounted Police. The City is surrounded by relatively sparsley populated prairie stretching eastward from the adjacent Rocky Mountains. Calgary is a service and distribution centre for the agricultural economy of Southern Alberta and has become a focus of the administrative and technical activities of the energy industry in this resource rich Province.

Early development of the City occurred on a rectangular grid type pattern of streets and by 1950 the City had grown to a population of 125,000 persons. Since 1950, population increased a further half million people and most neighbourhoods developed during that period have been of a tributary type using a hierarchical street pattern of residential streets feeding traffic on to collector streets and arterial roadways.

Of the present population (625,000 persons) 52% live in single family detached homes, 7% live in duplex units, 22% in apartments, 10% in row housing and 9% in other forms of dwellings such as mobile homes. The average number of occupants for a single family home is 3.16. Development trends over the past decade have resulted in a dwelling density of about 5 units per acre (gross) or a population of 16 persons per acre. The average house price is $100,000 Canadian (1982) and average family income is $42,000 Canadian (1982). Most residential areas are zoned to allow a mix of accommodation types and densities encouraging a wide distribution of persons of various socio-economic character.

There are 1.5 passenger vehicles registered per dwelling unit - Calgarians make about three vehicle trips per day, (over half the population is in the work force) and make 93 annual transit rides per capita.

2.1 Calgary Street Standards

All local urban government authorities in Canada have some sort of specific engineering standards for subdivision road design. These design standards ensure consistent and safe subdivision construction and should reflect the objectives of the various parties responsible for both the construction and maintenance of the roadways. For example, in Calgary where residential, collector and to a certain extent major roadways, are constructed by the subdivision developer, the primary objective of the developer is to minimize capital expenditure. The City of Calgary on the other hand, wishes to ensure that the roadway design standards will minimize future maintenance costs in addition to being concerned that the circulation system is based upon a functional classification of roadways.

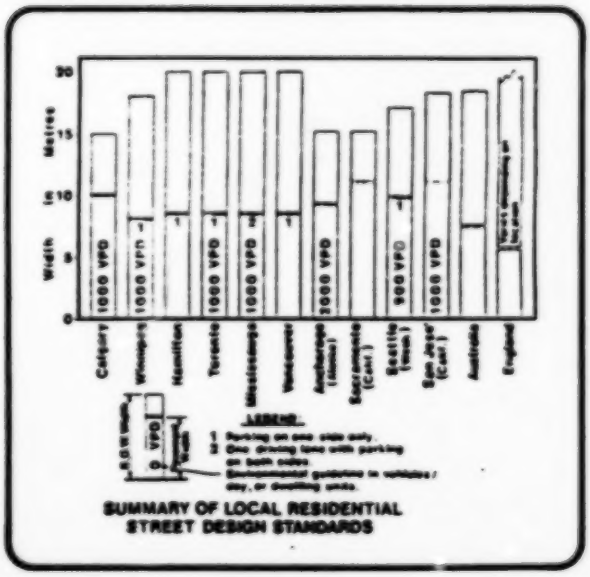
There are many reasons, aside from a capital cost or maintenance perspective, for hierarchical road classification including:

- the locating of important traffic generating land uses;
- the degree of frontage access control to be exerted along a road;
- the allocation of priority of one road over another when installing traffic control devices;
- the provision of increased consistency in resolving traffic management conflicts; and
- proper recognition of both the traffic service and local amenity requirements of roads, and the inherent conflicts that occur.

Over the past two decades there have been distinct changes in design philosophies regarding residential neighourhoods throughout the world. Grid pattern design has been replaced by subdivision plans characterized by cul-de-sacs and crescents. There have also been accompanying changes to the municipal street standards in Calgary. Figures 1 and 2 provide a comparison of Calgary's right-of-way and pavement width standards to those of several other Canadian and U.S. centres for local residential and collector roadways. Also included on these tables are standards obtained from England and Australia.

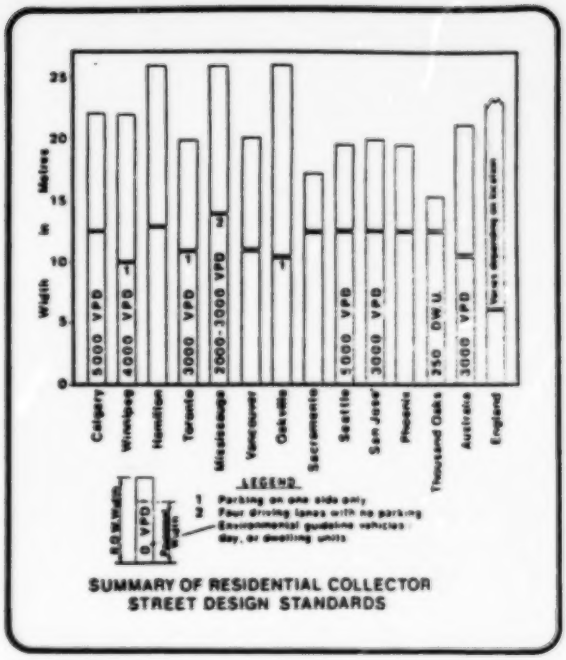
As can be seen from both Figures 1 and 2, the standards employed vary from one city to another across North America and for that matter standards employed in England and Australia are also different. The differences reflect local bylaws relating to parking and access control and also local travel patterns and habits and engineering practices. In comparison with other jurisdictions, the current roadway standards employed in Calgary do not appear to be extreme on either end of the design spectrum.

FIGURE 1



SUMMARY OF LOCAL RESIDENTIAL STREET DESIGN STANDARDS

FIGURE 2



SUMMARY OF RESIDENTIAL COLLECTOR STREET DESIGN STANDARDS

In addition to physical roadway standards, the City of Calgary has adopted "environmental" guidelines for the various categories of roadways in the City. The environmental guidelines include such edge conditions as building setback and traffic factors such as the levels of the traffic that are considered "acceptable" on the various classifications of roadways. Speed limit on residential and collector streets is 50 kilometres per hour. These guidelines are employed in the design of neighborhoods and in assessing problems identified by area residents. Over the last decade, the City of Calgary Transportation Department has conducted numerous community shortcutting studies at the request of local residents. The environmental guidelines are used to assess traffic problems on residential and collector streets. As a result of these studies, many traffic control measures have been implemented in residential areas throughout Calgary.

The standards currently employed by the City of Calgary have evolved from many years of experience. The engineering standards for pavement widths and right-of-ways have been established to accommodate traffic flow and parking, and in response to utility spacing and location requirements. The environmental guidelines were established based upon experience in other centres and a subjective assessment of the levels of traffic at which complaints are received.

Despite the existence of environmental guidelines there has been no previous documented attempt to determine the relationship between traffic volume and environmental quality on local residential streets. One of the main objectives of the work detailed in this paper was to attempt to determine the "Threshold of Good Environment" in residential areas as it relates to traffic volumes. Other objectives included determining other attitudes and perceptions of Calgary residents as they apply to the local transportation environment including: roadway width, on-street parking, spacing of driveways, housing types and setbacks.

Determining the above information will be fundamental to the establishment of logical subdivision plans which may in turn lead to more cost-effective housing.

3.0 Objectives of Street Standards Review

In 1984, the Calgary Chapter of the Urban Development Institute (representatives of the land development industry) approached the City of Calgary with proposals to reduce the engineering standards and at the same time increase the amount of traffic (by 50%) considered acceptable on the residential and collector roadways. In addition, within the context of a review of roadway standards, an examination of edge conditions on residential and collector roadways was also considered appropriate. Changes to the pavement and right-of-way widths have implications on the building setback and on site parking requirements. This review of standards was initiated out of a desire to reduce future subdivision construction costs and to establish absolute minimum standards. This request resulted in the establishment of a task force to review the issues of the engineering standards and environmental guidelines.

4.0 Survey of Calgary Residents

4.1 Focus Group Discussions

As part of the design phase of the survey of the attitudes and opinions of Calgary residents towards the traffic on the streets outside their homes, two in-depth discussion sessions were conducted. The objectives of these discussions were to identify:

1) how traffic is viewed in relation to other community attributes;

2) variables that can influence people's perceptions of traffic;

3) important features of street and community design;

4) differences between people bothered by traffic and people not bothered by traffic.

All of the discussants lived on collector standard streets which carried relatively high volumes of traffic, but they were divided into two groups. One group was annoyed by traffic on their streets while members of the other group were not bothered by the same or similar conditions. Each group was comprised of 10 - 12 discussants and a trained group discussion moderator. Sessions were audio-recorded for later analysis and were observed in progress through a one-way mirror by Transportation Department representatives.

Among discussants who were annoyed by the traffic volume on their streets, traffic volume was a major source of dissatisfaction in their day-to-day lives. These participants found it difficult to discuss any of the positive aspects of their communities or streets, dwelling instead on the negative aspects. They were annoyed with the traffic primarily because of noise, concern over the safety of their children, speeding vehicles and difficulties some had with vehicular access to their properties. Despite their dissatisfaction, most were not willing to more elsewhere.

Among discussants who were not annoyed by the traffic on their street, most were very satisfied with the street and neighbourhood in which they lived. They expressed satisfaction with their homes, neighbours, proximity to schools, access to public transportation, the beauty of their neighbourhoods, nearby parks, convenient parking, convenient laneways (behind their homes), and property values. They appeared to prefer the grid style designs of most of their communities and the convenience of their addresses being easy to find.

It appeared that the differences in annoyance with traffic between the two groups mostly resulted from differences in the attitudes and experiences of the individuals than from differences in traffic and street design characteristics. Of the participants who lived on busy streets and were not annoyed by the traffic, most had the attitude that traffic had to go somewhere while of those who were annoyed, most had the attitude that less traffic should be on their street. There appeared to be an association between perceived change in traffic levels over time and home owner satisfaction; dissatisfaction resulting from unexpected increasing traffic levels.

In discussing issues related to street design, respondents offered suggestions on how streets could be more livable. Noise of traffic was of greater concern than speed, volume, safety, buses, etc. Planting, buffering and increasing the distance of homes from the street, were suggested improvements which might help reduce traffic noise. Respondents favoured laneways, and some were willing to pay extra for paved laneways. All discussants liked paved sidewalks, some preferring them only on one side of the street, with others preferring them on both sides of the street.

4.2 Public Survey

The quantitative assessment of householder's perceptions involved a telephone survey of 1,060 Calgary residents. Of these, 360 were selected randomly throughout the city. To compare views of residents of different communities, a further 700 respondents were selected from 10 residential neighbourhoods (70 per neighbourhood). The samples were randomly selected from a reverse telephone directory. The findings from the focus group sessions were used extensively during the design of the survey instrument which contained 43 questions and took approximately 15 minutes to administer. The survey was fielded between November 28 and December 20, 1984.

Table 1

Perceptions of Various Neighbourhood Characteristics

	Average* Response (1-3)
Easy to get into from other parts of the city	2.66
Convenient schools	2.64
Convenient shopping	2.60
Is a quiet place to live	2.58
Has adequate bus service	2.57
Is safe for children	2.55
Neighbours likeable	2.56
An attractive place to live	2.54
Acceptable traffic volumes	2.53

* "Exactly Describe" = 3
"Somewhat Describe" = 2
"Not Describe" = 1

The neighbourhood characteristics assessed by this survey can be summarized as:

1. Safety of children
2. Quietness.
3. Attractiveness.
4. Traffic Volumes.
5. Access.
6. Schools.
7. Public Transit.
8. Shopping.

All of these characteristics were found to be adequate or acceptable to the majority of respondents. Neighbourhood traffic was, however, the least acceptable characteristic as shown in Table 1. About ten percent of the respondents reported unacceptable amounts of traffic in their neighbourhoods. Table 2 shows that low traffic volumes was the fourth most important of the characteristics assessed.

Table 2

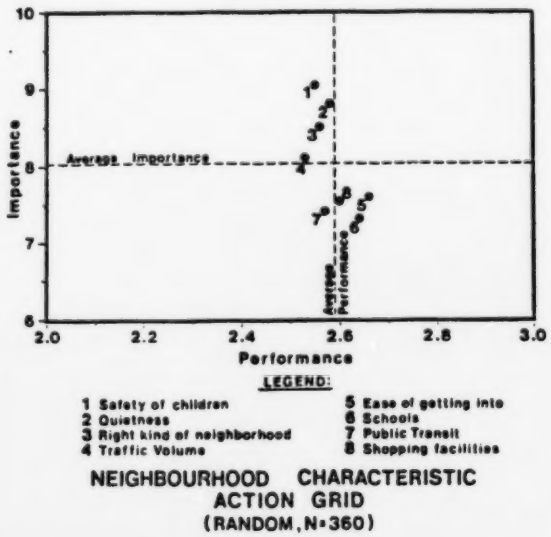
Importance of Various Characteristics of Neighbourhoods

Characteristic	Importance Rating *
Safety of Children	9.04
Quietness	8.80
Attractiveness	8.50
Traffic Volumes	8.10
Access	7.59
Shopping	7.53
Public Transit	7.40
Schools	7.30

*Respondents were asked to rate the importance of the above charactristics on a scale from 1 to 10. A "10" meant extremely important an a "1" meant not at all important.

Plotting the average importance scores against the average performance score or acceptability, the traffic volume issue was perceived by Calgary residents to be above average in importance and below average in acceptability (Figure 3).

FIGURE 3



NEIGHBOURHOOD CHARACTERISTIC ACTION GRID (RANDOM, N=360)

With respect to the acceptability of traffic volume in comparision to other characteristics of streets, traffic volume was found to be more adequate or acceptable than characteristics such as attractiveness of streets, speeding traffic, adequacy of parking, and the ease with which first time visitors could find an address. Traffic volumes were less acceptable than the width of streets, convenient access to transit, the adequacy of sidewalks and street lighting (Table 3).

Table 3

Perceptions of Various Street Characteristics

Statement	Average* Response (1-3)
Has enough street lights	2.77
Has enough sidewalks for pedestrians	2.75
Has easy access to public transit	2.61
Is wide enough for the traffic	2.59
Has too much traffic	2.46
Is an attractive street to live on	2.46
Has too many speeders	2.43
Has adequate parking along the street	2.32
Is easy for first-time visitors to find	2.24

*For "has too much traffic" and "has too many speeders", "exactly describe" = 1, "somewhat describe" = 2, and "not describe" = 3; for all remaining characteristics, "exactly describe" = 3, "somewhat describe" = 2 and "not describe" = 1.

Tables 4, 5 and 6 show that only six percent of Calgarians were dissatisfied with their neighbourhoods, eleven percent were dissatisfied with the street on which they lived, and thirty-five percent were annoyed by traffic on their street. Respondents were primarily annoyed by speeding traffic and traffic noise.

Table 5

Respondents' Overall Satisfaction with Street They Live on

	(%)
Very Satisfied	45
Moderately Satisfied	44
Very or Moderately Dissatified	11
Not Stated	--

Like Most About Street	**(%)**
Appearance	34
Quiet/Atmosphere	30
Traffic/Parking	27
Neighbors/People	16
Access/Location	17
Other Likes	18
Nothing	3
Not Stated	3
	*148

Like Least About Street	**(%)**
Traffic/Parking	34
Appearance	24
People/Pets	13
Other Dislikes	25
Nothing	19
Not Stated/Don't Know	8
	*123

* Adds up to more than 100% due to multiple mentions.

Table 4

Overall Satisfaction With Neighbourhood

	(%)
Very Satisfied	48
Moderately Satisfied	46
Moderately or Very Dissatisfied	6
Not Stated	--

Table 6

Level of Annoyance with Traffic

	(%)
Extremely Annoyed	5
Very Annoyed	4
Somewhat Annoyed	26
Not Annoyed	65
Not Stated	--

What Annoys You About Traffic

	(%)
Speeders	59
Noise	46
Safety of Children	18
Shortcutting	17
Volume	7
Buses	7
Trucks	6
Other	31
	*191

* Adds up to more than 100% due to multiple mentions.

NOTE: Out of the total sample, 364 respondents were "somewhat", "very" or "extremely annoyed" by traffic. Out of the random sample 127 respondents were "somewhat", "very" or "extremely annoyed" by traffic.

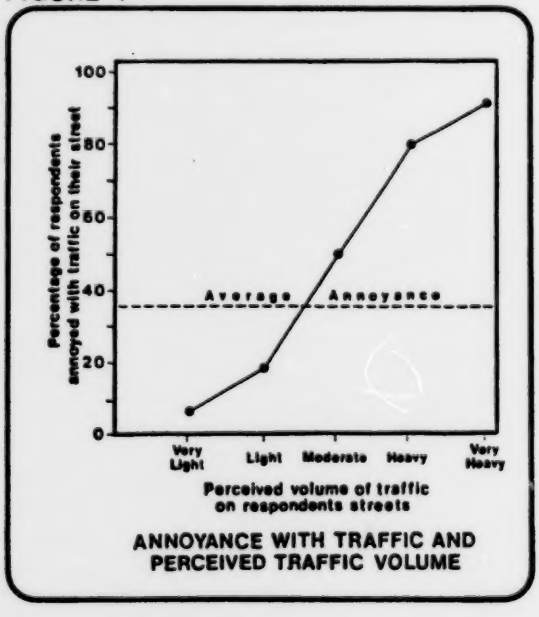
In order to assess if annoyance from traffic was related to perceptions of traffic volume, respondents were asked if they considered the volume of traffic on their street to be very heavy, heavy, moderate, light or very light. The response to this question is shown in Table 7. Figure 4 demonstrates the relationship between perceived traffic volume and level of annoyance with traffic. The more traffic the respondents perceived on their street the more likely they were to be annoyed with traffic on their street. Figures 5 and 6 show that among respondents who were more annoyed by traffic, or similarly, among respondents who perceived higher volumes of traffic on their streets, fewer were satisfied with their communities or the streets on which they lived.

Table 7

Perceptions of the Volume of Traffic on Respondents' Streets

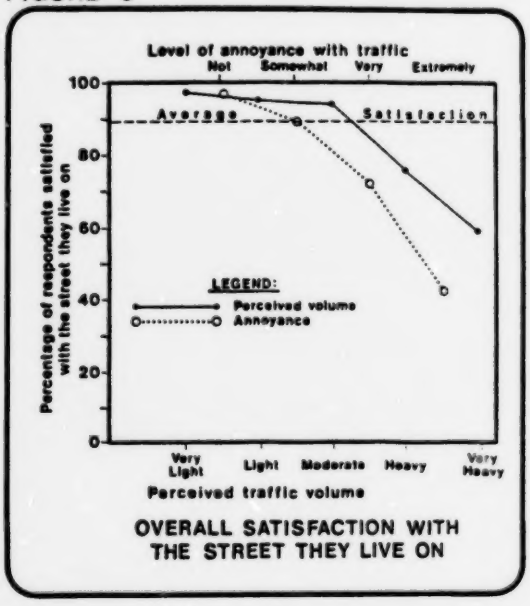
	(%)
Very Heavy	4
Heavy	11
Moderate	34
Light	28
Very Light	22
Not Stated/Don't Know	1

FIGURE 4



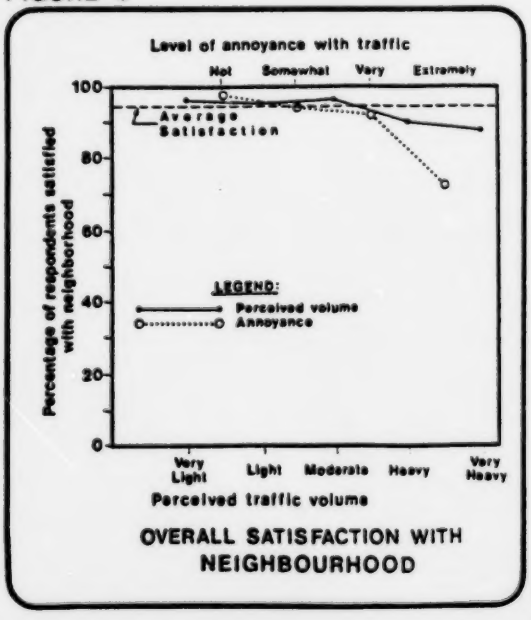
ANNOYANCE WITH TRAFFIC AND PERCEIVED TRAFFIC VOLUME

FIGURE 5



OVERALL SATISFACTION WITH THE STREET THEY LIVE ON

FIGURE 6

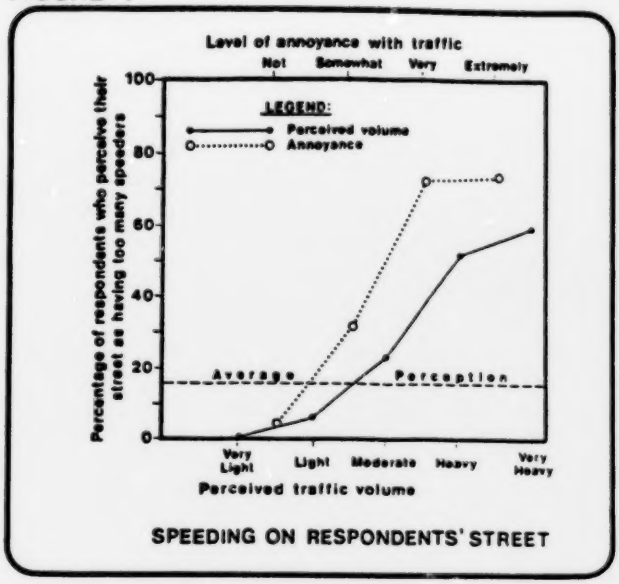


OVERALL SATISFACTION WITH NEIGHBOURHOOD

Figure 7 shows how feelings of annoyance and perceptions of traffic volume related to perceptions of having too many speeders on the street. The survey response does not differentiate between volume of speeders and speed of traffic as the factor causing annoyance with speeders. It is unclear whether the use of volume control guidelines on a street acts as a satisfactory proxy for controlling the number of speeders, or whether more investigation into the speed of traffic and speed limits might be useful.

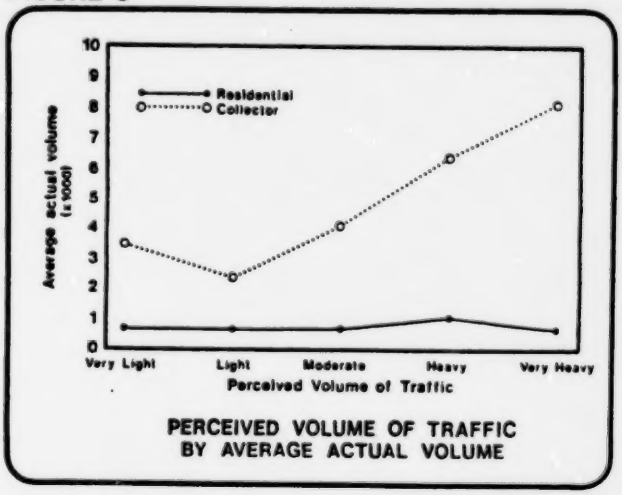
To relate the public's perceptions of their street to the city street standards, a comparison was made between actual measured traffic volumes and the subjective values applied to them by respondents. The streets selected for traffic volume counts ensured a cross section of survey respondents who perceived either very light, light, moderate, heavy or very heavy traffic on their streets. Each sample street was classified as either a "Collector" or "Residential" street based on the City of Calgary's road classification standards. A sample of 206 householders on 77 different streets was used in the comparison. On residential streets with an average of less than 1500 cars per day, no correlation could be found between actual and perceived volumes. On collector streets, however, perceived volume did correlate with average actual volumes, that is, the higher the average actual volume, the higher the perceived volume. As shown in Figures 8 and 9, noticeable environmental impacts appear to result when traffic volumes exceed 5,000 vehicles per day. Below that level, environmental impacts from traffic appear to be offset by other attributes which can lead to satisfaction with where one lives.

FIGURE 7



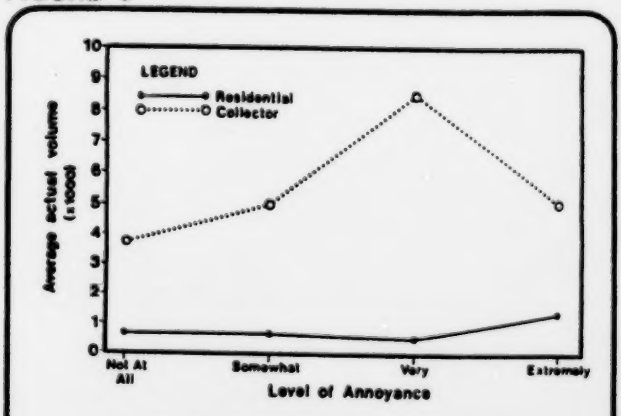
SPEEDING ON RESPONDENTS' STREET

FIGURE 8



PERCEIVED VOLUME OF TRAFFIC BY AVERAGE ACTUAL VOLUME

FIGURE 9



LEVEL OF ANNOYANCE WITH TRAFFIC BY AVERAGE ACTUAL VOLUME

5.0 Respondents' Preferred Street Design

The survey assessed respondents' preferences towards various elements of street design, the results of which are shown in Table 8. It should be noted that this represents these preferences only among respondents who wanted to live in an urban, single-family dwelling.

In essence, the preferences tended to reflect the status quo, that is, the way things presently are in Calgary. Most respondents preferred:

1) parking on both sides of the street.

2) a home located somewhere in the middle of the block (14 percent preferred a corner lot).

3) sidewalks on both sides of the street.

4) a back laneway, preferably paved.

5) underground electrical servicing.

6) a garage, preferably accessed from the front of their property.

7) easy access to public transit, preferably within 2-3 blocks of their home.

8) their home located close to the front street with a small front yard.

There were no major differences between the preferences of male and female respondents. Respondents of the different age groups had the same preferences except that those 55 years or older preferred garage access from the back of their property and to have transit service within one block of their home. Respondents in the different income groups had the same preferences except that those in households earning

Table 8

Type of Street Attributes Most Suited to Respondents' Needs*

Parking	(%)
Parking on both sides	60
Parking on only one side	9
No parking on street	13
No preference	18

Location of Home on Street	(%)
On the corner	14
Mid block	64
No preference	22

Location of Home on Lot	(%)
Close to the front street	54
Back from the street yard	27
No preference	19

Sidewalks	(%)
On both sides	89
On only one side	8
No sidewalks at all	-
No preference	3

Back Laneway	(%)
Yes	79
No	17
No preference	4

Paved Back Laneway	(%)
Yes	65
No	18
No Preference	17

Electrical Servicing	(%)
Above ground	4
Underground	77
No preference	19

Garage	(%)
Yes	99
No	1
No preference	-

Access to Garage	(%)
From front of property	42
From back of property	32
No preference	26

Want Easy Access to Transit Service	(%)
Yes	79
No	8
No preference	13

Where Want to Access Transit Service	(%)
Right outside home	3
Within one block	42
Within 2-3 blocks	50
Within 4-6 blocks	5
Seven or more blocks	0
Not stated/Don't know	0

*Random Sample (N = 241) except "Transit Access" and "Paved Back Lane" (N = 190).

less than $40,000 per year preferred accessing garages from the back of their property, and those earning less than $20,000 per year preferred transit service within one block of their home as well as having their homes situated further back from the street with large front yards. Garage access from the back of the property was also the preference of those planning to move within the next year, those living in Calgary for more than 20 years, and those extremely annoyed by the traffic on their streets. Transit service within one block was as desirable as transit within 2-3 blocks among those respondents who perceived very heavy traffic on their streets.

Respondents were asked which of four selected characteristics they would be most willing to live without in order to make their most suitable street more affordable. As shown in Table 9, respondents were more willing to give up underground electrical services than they were to give up a back laneway, parking along the street or sidewalks.

There were, however, some major differences in these results among the ten selected communities. Respondents from half the communities were most willing to give up having a back laneway. Respondents from other communities would be most willing to give up underground electrical servicing.

Finally, in order to assess the concept of narrower residential streets, respondents were asked whether they would prefer to have parking on both sides of the street with only one lane for travelling in both directions, parking on only one side of the street with two lanes of traffic or no parking whatsoever, given that the street was wide enough for only three lanes. Most respondents preferred to have only one lane of parking while the least preferred option was to have two lanes of parking and only one lane for travelling in both directions (See Table 9).

Table 9

Amenity Priorities & Street Width

"In order to make your most suitable street more affordable which of the following would you be most willing to live without:"

	Random Sample (N=241) (%)
Parking along your street	19
Sidewalks in front of your home	8
A back laneway	24
Underground electrical services	45
None of the above	3
Not stated	1

"By giving up parking along your street, would you be willing to give up parking on:"

	(N=46) (%)
Only one side	61
Both sides	30
Not stated	9

"Given that your most suitable street was wide enough for only three lanes, which would you prefer? Would you prefer to have parking in two lanes with only one lane for travelling in both directions, parking on only one side of the street with two lanes of traffic or no parking whatsoever?"

	(N=241) (%)
Two lanes parking	16
One lane parking	57
No parking	26
Not stated	1

6.0 Conclusions

As stated earlier, the purpose of this work was to elicit opinions from the public at large with regard to general street characteristics. To determine if, besides the people who complain, there is any consensus with regard to acceptable and affordable street standards. This "Threshold of Good Environment" has been associated with traffic volumes, and to a large extent, new neighbourhoods can be designed to control traffic volumes on various types of streets.

The survey showed that factors related to traffic such as safety of children, quietness and traffic volumes are important characteristics of a neighbourhood - all of above average importance. Respondents reported 94% satisfaction with their neighbourhoods and 89% satisfation with their streets. However, 35% were annoyed by traffic, of which 59% mentioned speed of traffic as an annoyance, 46% mentioned noise, 18% safety of children and only 7% mentioned volume. Nevertheless, the more traffic the respondents perceived on their street the more likely they were to be annoyed by it. For collector streets with traffic volumes over 2,000 vehicles per day, there was a correlation between actual and perceived volumes of traffic and annoyance occurred above the existing 5,000 vehicles per day guideline.

On residential streets there appeared to be no correlation between actual and perceived volumes. Other factors, perhaps related to speeders, may be relevant. Perhaps individual respondents varied expectations dominate the data in a more benign environment. Further investigation is required on residential streets before any conclusions can be drawn.

With respect to street engineering standards, respondents expressed general satisfaction with the status quo. It appears prudent to continue providing items such as street pavement (which is expensive to change later) to existing standards and allow items such as sidewalks or lane paving to be options which can be added later at home owners expense.

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